

1 IN THE CLAIMS

2 Please amend the claims as follows:

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4 1. **(Original)** An improved time of flight mass spectrometer comprising:

5 a deflector for deflecting an ion from an ion path consisting of more than two plates

6 arranged across said ion path in such a way that, during a given passage through said deflector,

7 said ion must pass between two and only two adjacent plates; and

8 a detector for detecting said ion;

9 wherein each of said plates is energized to a potential.

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11 2. **(Original)** An improved time of flight mass spectrometer according to claim 1 wherein said

12 deflector is formed by a series of conductive plates.

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14 3. **(Original)** An improved time of flight mass spectrometer according to claim 2 wherein at

15 least one of said conductive plates is metallic.

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17 4. **(Original)** An improved time of flight mass spectrometer according to claim 1 wherein said

18 deflector deflects substantially all ions away from said ion path.

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20 5. **(Original)** An improved time of flight mass spectrometer according to claim 1 wherein said

21 detector is responsive to the number of ions not deflected away from said ion path.

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1 6. (Original) An improved time of flight mass spectrometer according to claim 1 wherein said
2 ions are deflected away from said ion path along a plurality of directions.

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Cont'd
5 7. (Original) An improved time of flight mass spectrometer according to claim 6 wherein said
mass deflector is formed by a series of conductive plates.

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7 8. (Original) An improved time of flight mass spectrometer according to claim 6 wherein said
8 deflector is used as a mass selector.

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10 9. (Once Amended) An improved time of flight mass spectrometer according to claim 1
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11 wherein at least one of said plates is energized to a positive potential and another of said plates
12 is energized to a negative potential.

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- 1 10. (Original) A multideflector for analyzing ions in a time of flight mass
2 spectrometer comprising:
3 an ion source;
4 an ion detector;
5 a flight tube for transporting ions formed within said ion source; and
6 a gate disposed along said flight tube;
7 wherein said ion source produces ions capable of travel along said flight tube, and
8 wherein said detector detects the presence of said ions; and
9 wherein said gate is formed by a series of metal plates arranged across said flight tube in
10 such a way that, during a given passage through said multideflector, said ions must pass between
11 two and only two adjacent plates, said plates being aligned to deflect substantially all ions away
12 from the direction of ion propagation along said flight tube.
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14 11. (Original) A multideflector according to claim 10 wherein at least one of said plates is
15 conductive.
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17 12. (Original) A multideflector according to claim 11 wherein at least one of said conductive
18 plates is metallic.
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20 13. (Original) A multideflector according to claim 10 wherein said gate deflects said ions into a
21 plurality of directions.
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1 14. (Original) A multideflector according to claim 10 wherein said ion source includes a laser.

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4 15. (Original) A multideflector according to claim 10 wherein a data acquisition system is used
to measure the time of flight of ions from said ion source to said detector.

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6 16. (Original) A multideflector according to claim 15 wherein a multiplicity of detectors are
7 used.

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9 17. (Original) A multideflector according to claim 10 wherein a reflector is used to alter the
10 path of ions away from said direction of propagation.

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12 18. (Original) A multideflector according to claim 10 wherein a gate is used to select ions
13 based on mass.

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1 19. (Original) A mass selector for use in a time of flight instrument comprising:

2 a flight tube;

3 a gate; and

4 an ion source;

5 wherein said ion source produces ions that travel through said flight tube, and wherein

6 said gate impedes the travel of said ions by deflecting said ions into at least two directions.

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8 20. (Original) A mass selector according to claim 19 wherein said gate is formed of a plurality
9 of metals plates, of which at least one of said metallic plates is energized.

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11 21. (Original) A mass selector according to claim 19 which includes a computer controller.

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13 22. (Original) A mass selector according to claim 21 wherein said computer controller includes
14 means to vary voltages applied to said gate.

1 23. (New) An improved time of flight mass spectrometer comprising:

2 a multideflector for deflecting ions from an ion path consisting of more than two bipolar
3 deflection plates each comprising a pair of metal plates separated from one another by an
4 insulator, said bipolar deflection plates being arranged across said ion path in such a way that,
5 during a given passage through said multideflector, each of said ions must pass between two and
6 only two adjacent bipolar deflection plates; and

7 a detector for detecting said ions;

8 wherein each of said metal plates is energized to a potential and the potentials of the
9 metal plates of each pair have opposite polarities.

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11 24. (New) An improved time of flight mass spectrometer according to claim 23 wherein the
12 total thickness of each bipolar deflector plate is in order of 0.1 mm.

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14 25. (New) An improved time of flight mass spectrometer according to claim 23 wherein the
15 insulator consists of polyamide layer.

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17 26.(New) An improved time of flight mass spectrometer according to claim 24 wherein the
18 insulator consists of polyamide layer.

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20 27.(New) An improved time of flight mass spectrometer according to claim 23 wherein the
21 bipolar deflection plates are curved.

1 28. (New) An improved time of flight mass spectrometer according to claim 24 wherein the
2 bipolar deflection plates are curved.

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5 29.(New) An improved time of flight mass spectrometer according to claim 25 wherein the
6 bipolar deflection plates are curved.

7 30. (New) An improved time of flight mass spectrometer according to claim 26 wherein the
8 bipolar deflection plates are curved.

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10 31. (New) An improved time of flight mass spectrometer according to claim 23 wherein the
11 bipolar deflection plates are placed adjacent and parallel to one another such that each metal plate
12 of every bipolar deflection plate is facing the metal plate of the adjacent bipolar deflection plate
13 which has the opposite polarity.

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15 32. (New) An improved time of flight mass spectrometer according to claim 31 wherein the
16 distance between adjacent bipolar deflection plates is a constant.

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18 33. (Once Amended) An improved time of flight mass spectrometer according to claim 32
19 wherein the bipolar deflection plates are curved.

1 34. (Once Amended) An improved time of flight mass spectrometer according to claim 31
2 wherein the distance between adjacent bipolar deflection plates varies as a function of position
3 within the multideflector.

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5 Cont'd
6 35. (Once Amended) An improved time of flight mass spectrometer according to claim 34
7 wherein the bipolar deflection plates are curved.

8 36. (Once Amended) An improved time of flight mass spectrometer according to claim 23
9 wherein the potentials on the conducting electrodes is held constant.

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11 37. (Once Amended) An improved time of flight mass spectrometer according to claim 23
12 wherein the potentials on the conducting electrodes is varied as a function of time.

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14 38. (Once Amended) An improved time of flight mass spectrometer according to claim 32
15 wherein the potentials on the conducting electrodes is held constant.

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17 39. (Once Amended) An improved time of flight mass spectrometer according to claim 32
18 wherein the potentials on the conducting electrodes is varied as a function of time.

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20 40. (Once Amended) An improved time of flight mass spectrometer according to claim 1
21 wherein said deflector deflects substantially all ions from one ion path to a second ion path.